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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,202	03/01/2002	Wei-Min Zhang	019927-001900US	8599

20350 7590 04/20/2005

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EXAMINER	
GANDHI, DIPAKKUMAR B	
ART UNIT	**PAPER NUMBER**
2133	

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/087,202	ZHANG ET AL.	
	Examiner	Art Unit	
	Dipakkumar Gandhi	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment

1. Applicants' request for reconsideration filed on 1/20/2005 has been reviewed.

2. The amendment filed on 1/20/2005 has been entered.

3. Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 9, 10, 20, 21, 22, 23, 33, 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Donahoo et al. (Multiple-channel multicast scheduling for scalable bulk-data transport, INFOCOM'99, March 1999, Volume 2, pages 847-855).

Donahoo et al. anticipate claim 1.

Donahoo et al. teach a method for providing redundancy to multi-channel data transmission comprising: selecting a portion of original data from each of a plurality of original channels adapted to transmission through a communication medium; performing at least one encoding operation using said portions of original data to produce at least one portion of redundancy data; including said portion of redundancy data in at least one redundancy channel; and transmitting said redundancy channel along with said original channels through said communication medium (pages 848, 852, 853, Donahoo et al.).

- Donahoo et al. anticipate claim 2.

Donahoo et al. teach the method wherein said selecting, performing, and including steps are repeated before said transmitting step (pages 852, 853, Donahoo et al.).

- Donahoo et al. anticipate claim 3.

Donahoo et al. teach the method further comprising the step of: while performing said transmitting step, repeating said selecting, performing, and including steps (pages 852, 853, Donahoo et al.).

- Donahoo et al. anticipate claim 4.

Donahoo et al. teach the method wherein said encoding operation corresponds to a parity bit calculation (page 855, Donahoo et al.).

Donahoo et al. anticipate claim 9 (pages 848, 852, 853, Donahoo et al.).

- Donahoo et al. anticipate claim 9.

Donahoo et al. teach a method for correcting error in multi-channel data transmission having redundancy, the method comprising: receiving at least one redundancy channel and a number of original channels belonging to a plurality of original channels, said at least one redundancy channel and said plurality of original channels being transmitted over a communication medium; selecting a portion of redundancy data from said redundancy channel; selecting a portion of original data from each of said number of original channels; and performing at least one decoding operation using said portion of redundancy data and said portions of original data to correct at least one error in said plurality of original channels (pages 848, 852, 853, Donahoo et al.).

- Donahoo et al. anticipate claim 10.

Donahoo et al. teach the method wherein said step for performing at least one decoding operation comprises the step of: detecting the existence of at least one error (pages 849, 852, Donahoo et al.).

- Donahoo et al. anticipate claim 20.

Donahoo et al. teach the method wherein said step for performing at least one decoding operation further comprises the step of: correcting at least one error (page 849, Donahoo et al.).

- Donahoo et al. anticipate claim 21.

Donahoo et al. teach the method wherein said steps for selecting a portion of redundancy data, selecting a portion of original data, and performing at least one decoding operation are repeated after said receiving step (pages 852-853, Donahoo et al.).

- Donahoo et al. anticipate claim 22.

Donahoo et al. teach the method wherein said steps for selecting a portion of redundancy data, selecting a portion of original data, and performing at least one decoding operation are repeated while performing said receiving step (pages 852-853, Donahoo et al.).

- Donahoo et al. anticipate claim 23.

Donahoo et al. teach the method wherein said decoding operation corresponds to a parity bit calculation (page 855, Donahoo et al.).

- Donahoo et al. anticipate claim 33.

Donahoo et al. teach a system for providing redundancy to multi-channel data transmission comprising: means for selecting a portion of original data from each of a plurality of original channels adapted to transmission over a communication medium; means for performing at least one encoding operation using said portions of original data to produce at least one portion of redundancy data; means for including said portion of redundancy data in at least one redundancy channel; and means for transmitting said redundancy channel along with said original channels in said communication medium (pages 848, 852, 853, Donahoo et al.).

- Donahoo et al. anticipate claim 34.

Donahoo et al. teach a system for correcting error in multi-channel data transmission having redundancy, the system comprising: means for receiving at least one redundancy channel and a plurality of original channels transmitted over a communication medium; means for selecting a portion of redundancy data from said redundancy channel; means for selecting a portion of original data from each of said original channels; and means for performing at least one decoding operation using said portion of redundancy data and said portions of original data to correct at least one error in said portions of original data (pages 848, 852, 853, Donahoo et al.).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 5-6, 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donahoo et al. (Multiple-channel multicast scheduling for scalable bulk-data transport, INFOCOM'99, March 1999, Volume 2, pages 847-855) as applied to claim 1 above, and further in view of Kumar (US 5,949,796).

As per claim 5, Donahoo et al. substantially teach the claimed invention described in claim 1 (as rejected above).

However Donahoo et al. do not explicitly teach the specific use of the encoding operation corresponding to a block code.

Kumar in an analogous art teaches block ECC encoding using Reed-Solomon or BCH block codes, for example, because the construction of the codeword has a specific characteristic bit length. For block codes, the codeword length is equal to the characteristic ECC block code length (col. 35, lines 17-22, Kumar).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Donahoo et al.'s patent with the teachings of Kumar by including an additional step of using the encoding operation corresponding to a block code.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that using the encoding operation corresponding to a block code would provide the opportunity to use an encoder for a block code that maps a k-symbol input sequence into an n-symbol output sequence. Each n-symbol block depends only upon a specific k-symbol block and on no others.

- As per claim 6, Donahoo et al. and Kumar teach the additional limitations.

Kumar teaches that block code is a Reed-Solomon code (col. 35, lines 17-22, Kumar).

- As per claim 24, Donahoo et al. and Kumar teach the additional limitations.

Kumar teaches the method wherein said decoding operation corresponds to a block code (col. 67, lines 6-9, Kumar).

- As per claim 25, Donahoo et al. and Kumar teach the additional limitations.

Kumar teaches the method wherein said block code is a Reed-Solomon code (col. 35, lines 17-18, Kumar).

9. Claims 7, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donahoo et al. (Multiple-channel multicast scheduling for scalable bulk-data transport, INFOCOM'99, March 1999, Volume 2, pages 847-855) as applied to claim 1 above, and further in view of Zhang (US 2001/0037485 A1).

As per claim 7, Donahoo et al. substantially teach the claimed invention described in claim 1 (as rejected above).

However Donahoo et al. do not explicitly teach the specific use of the method wherein an adaptively controlled level of redundancy is used to perform said encoding operation, said level of redundancy being adaptively controlled according to at least one measure of error-proneness associated with said original channels.

Zhang in an analogous art teaches that the number of error correcting bits ... information channel (page 1, paragraph 6, Zhang).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Donahoo et al.'s patent with the teachings of Zhang by including an additional step of using the method wherein an adaptively controlled level of redundancy is used to perform said encoding operation, said level of redundancy being adaptively controlled according to at least one measure of error-proneness associated with said original channels.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that it would provide the opportunity to perform encoding data based on the quality of the data channel.

- As per claim 15, Donahoo et al. and Zhang teach the additional limitations.

Zhang teaches the method wherein said step for performing at least one decoding operation comprises the step of: detecting the location of at least one error (page 3, paragraph 34, Zhang).

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Donahoo et al. (Multiple-channel multicast scheduling for scalable bulk-data transport, INFOCOM'99, March 1999, Volume 2, pages 847-855) and Zhang (US 2001/0037485 A1) as applied to claim 7 above, and further in view of Kumar (US 5,949,796).

As per claim 8, Donahoo et al. and Zhang substantially teach the claimed invention described in claim 7 (as rejected above).

However Donahoo et al. and Zhang do not explicitly teach the specific use of the method wherein said measure of error-proneness is a signal-to-noise ratio (SNR), signal-to-interference ratio (SIR), or bit error rate (BER).

Kumar in an analogous art teaches the method wherein said measure of error-proneness is a signal-to-noise ratio (SNR), (col. 12, lines 1-6, Kumar), signal-to-interference ratio (SIR), (col. 62, line 47, Kumar) or bit error rate (BER), (col. 31, lines 5-9, Kumar).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Donahoo et al.'s patent with the teachings of Kumar by including an additional step of using the method wherein said measure of error-proneness is a signal-to-noise ratio (SNR), signal-to-interference ratio (SIR), or bit error rate (BER).

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that it would provide the opportunity to determine quality of the channel and use the quality information for encoding the data.

11. Claims 11, 12, 13, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donahoo et al. (Multiple-channel multicast scheduling for scalable bulk-data transport, INFOCOM'99, March 1999, Volume 2, pages 847-855) as applied to claim 10 above, and further in view of Kono et al. (US 5,455,536).

As per claim 11, Donahoo et al. substantially teach the claimed invention described in claim 10 (as rejected above).

However Donahoo et al. do not explicitly teach the specific use of monitoring at least one error-indicating condition during said receiving step.

Kono et al. in an analogous art teach a bit error rate monitor for detecting a bit error rate of the demodulated result of the demodulator (col. 2, lines 10-12, Kono et al.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Donahoo et al.' s patent with the teachings of Kono et al. by including an additional step of monitoring at least one error-indicating condition during said receiving step.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that monitoring at least one error-indicating condition during said receiving step would provide the opportunity to determine the presence of errors in the data received at the receiver and apply error correction process.

- As per claim 12, Donahoo et al. and Kono et al. teach the additional limitations.

Kono et al. teach the method wherein said error-indicating condition relates to carrier signal reception (col. 1, lines 10-13, Kono et al.).

- As per claim 13, Donahoo et al. and Kono et al. teach the additional limitations.

Kono et al. teach the method wherein the error-indicating condition relates to demodulation (col. 2, lines 10-12, Kono et al.).

- As per claim 14, Donahoo et al. and Kono et al. teach the additional limitations.

Donahoo et al. teach the method wherein the error-indicating condition relates to in-channel error correction decoding (page 849, 852, 853, Donahoo et al.).

12. Claims 16, 17, 18, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donahoo et al. (Multiple-channel multicast scheduling for scalable bulk-data transport, INFOCOM'99, March 1999, Volume 2, pages 847-855) and Zhang (US 2001/0037485 A1) as applied to claim 15 above, and further in view of Kono et al. (US 5,455,536).

As per claim 16, Donahoo et al. and Zhang substantially teach the claimed invention described in claim 15 (as rejected above).

However Donahoo et al. and Zhang do not explicitly teach the specific use of monitoring at least one error-indicating condition during said receiving step.

Kono et al. in an analogous art teach a bit error rate monitor for detecting a bit error rate of the demodulated result of the demodulator (col. 2, lines 10-12, Kono et al.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Donahoo et al.' s patent with the teachings of Kono et al. by including an additional step of monitoring at least one error-indicating condition during said receiving step.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that monitoring at least one error-indicating condition during said receiving step would provide the opportunity to determine the presence of errors in the data received at the receiver and apply error correction process.

- As per claim 17, Donahoo et al., Zhang and Kono et al. teach the additional limitations.

Kono et al. teach the method wherein the error-indicating condition relates to carrier signal reception (col. 1, lines 10-13, Kono et al.).

- As per claim 18, Donahoo et al., Zhang and Kono et al. teach the additional limitations.

Kono et al. teach the method wherein said error-indicating condition relates to demodulation (col. 2, lines 10-12, Kono et al.).

- As per claim 19, Donahoo et al., Zhang and Kono et al. teach the additional limitations.

Donahoo et al. teach the method wherein the error-indicating condition relates to in-channel error correction decoding (page 849, 852, 853, Donahoo et al.).

13. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donahoo et al. (Multiple-channel multicast scheduling for scalable bulk-data transport, INFOCOM'99, March 1999, Volume 2, pages 847-855) as applied to claim 9 above, and further in view of Decker et al. (US 4,980,897).

As per claim 26, Donahoo et al. substantially teach the claimed invention described in claim 9 (as rejected above).

However Donahoo et al. do not explicitly teach the specific use of the method wherein said portions of original data are selected from a common position within their respective original channels.

Decker et al. in an analogous art teach that multi-channel trellis encoding ... vertical lines 19 (figure 8, col. 7, lines 1-4, Decker et al.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Donahoo et al.' s patent with the teachings of Decker et al. by including an additional step of using the method wherein said portions of original data are selected from a common position within their respective original channels.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that using the method wherein said portions of original data are selected from a common position within their respective original channels would provide the opportunity to correct the errors in the data in the original channels using the redundant data.

- As per claim 27, Donahoo et al. and Decker et al. teach the additional limitations.

Decker et al. teach the method wherein each said portion of original data consists of a bit (figure 1, col. 3, lines 50-57, Decker et al.).

- As per claim 28, Donahoo et al. and Decker et al. teach the additional limitations.

Decker et al. teach the method wherein each said portion of original data consists of a non-binary symbol (col. 14, lines 38-40, Decker et al.).

14. Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donahoo et al. (Multiple-channel multicast scheduling for scalable bulk-data transport, INFOCOM'99, March 1999, Volume 2, pages 847-855) as applied to claim 9 above, and further in view of Harkness et al. (US 2002/0059633 A1).

As per claim 29, Donahoo et al. substantially teach the claimed invention described in claim 9 (as rejected above).

However Donahoo et al. do not explicitly teach the specific use of the method wherein said communication medium is cable-based.

Harkness et al. in an analogous art teach that the communication medium 30 may be a public telephone network, air accessed by radiating antennas such as satellite, cellular, and terrestrial antennas, over cables such as the RF return over a cable plant, the Internet, or the like (figure 1, page 3, paragraph 29, Harkness et al.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Donahoo et al.' s patent with the teachings of Harkness et al. by including an additional step of using the method wherein said communication medium is cable-based.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that using the method wherein said communication medium is cable-based would provide the opportunity to transmit video, audio and data at fast speed using the large bandwidth of cable medium.

- As per claim 30, Donahoo et al. and Harkness et al. teach the additional limitations.

Harkness et al. teach the method wherein said communication medium is satellite-based (figure 1, page 3, paragraph 29, Harkness et al.).

- As per claim 31, Donahoo et al. and Harkness et al. teach the additional limitations.

Harkness et al. teach the method wherein said communication medium is terrestrial (figure 1, page 3, paragraph 29, Harkness et al.).

- As per claim 32, Donahoo et al. and Harkness et al. teach the additional limitations.

Harkness et al. teach the method wherein said original channels contain audio, video, and/or data signals (page 2, paragraph 14, Harkness et al.).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dipakkumar Gandhi whose telephone number is 571-272-3822. The examiner can normally be reached on 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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